ABSTRACT

A micro-electromechanical fluid ejection device includes a substrate that incorporates drive circuitry. A fluid inlet channel is defined through the substrate. A static nozzle chamber structure is positioned on the substrate to extend from the substrate and defines a static wall that bounds the fluid inlet channel to form part of a nozzle chamber. An active nozzle chamber structure has a roof wall that defines a fluid ejection port and an active wall that depends from the roof wall about the static wall to define a remaining part of the nozzle chamber. The active structure is displaceable with respect to the static structure towards and away from the substrate respectively to reduce and increase a volume of the nozzle chamber so that fluid in the nozzle chamber is ejected from the fluid ejection port. A fluid displacement member is positioned on the static wall to define a fluid displacement area that faces the roof wall to facilitate ejection of fluid from the fluid ejection port. At least two actuators are connected to the drive circuitry and are operatively arranged with respect to the active structure to displace the active structure towards and away from the substrate on receipt of an actuating electrical signal from the drive circuitry. A coupling structure is interposed between each actuator and the active structure. The coupling structures are configured and connected to the active structure to impart substantially rectilinear movement to the active structure on operation of the actuators.